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A Note on the existence of Temporal Isolation in Satyrid Butterflies

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George Thomson's article (*Ent. Record*, **83**: 87-90, 1971) concerning the possibility of temporal sub-speciation in *Maniola jurtina* (Linnaeus) brings to mind one known example of temporal isolation of two subspecies in the same locality and is related in kind with some studies that I have had underway for a number of years with populations of certain North American satyrid butterflies.

At Churchill, Manitoba, two subspecies of *Oeneis jutta* (Hübner) ostensibly occur together with temporal isolation. *Oeneis jutta* is one of several species of the genera *Oeneis* and *Erebia* which have biennial life-cycles and fly only in alternate years. Churchill is located right at the northern limit of the tree line and I have observed that *Oeneis jutta ridingiana* Chermock & Chermock is found here, principally in the taiga zone in even-numbered years, and that *Oeneis jutta alaskensis* (Holland) is also found here, principally on the open tundra (*Eriophorum* associations) in odd-numbered years. This cannot be construed as a case of temporal isolation having led to sub-speciation but instead is a case of temporal isolation maintaining two subspecies in otherwise geographic sympatric situations. It should be further noted that the temporal isolation of these two subspecies at Churchill is not complete for a certain degree of intergradation is noticeable in specimens from there.

Thomson's observations deal with a univoltine species (*M. jurtina*) which has a very long emergence and flight period of up to seven months in some areas. It is his contention that butterflies emerging at the opposite ends of this long flight period are temporarily isolated from each other and in the case of *M. jurtina* we are possibly seeing the very early stages in the formation of temporal subspecies. These observations with *M. jurtina* may be more closely related to studies that have been underway by Charles Remington, Arthur Shapiro, Harry Clench and other workers with another North American satyrid, *Euptychia cymela* (Cramer), which is univoltine, but in some localities exhibits a distinct 2nd brood. The 2nd brood emerges after the earlier brood has waned, but altogether too

soon to allow for the development of a second generation. Those persons working with this situation are studying it on the premise that two sibling species are involved, but have been unable to find any morphological characteristics that would serve to separate the two.

My personal work has dealt with those species having biennial life-cycles such as *Oeneis macounii* (Edwards), which flies only in odd-numbered years west of the Lake Winnipeg-Red River Valley area of Manitoba and only in even numbered years to the east of it. In 1966 and 1967 John Sorensen and I were so impressed with the possibility of these two temporally (and geographically) isolated blocks of populations having developed distinct subspeciation that we spent a great deal of time collecting long series of the species in eastern Manitoba (1966) and western Manitoba (1967). We were unable to distinguish morphological characters suitable for separating the two populations, but we did gain considerable knowledge of the habits and habitats of the species that became the basis of several papers (e.g. Blue Jay, 26: 38-40, 1968; Jour. Lepid. Soc., 21: 258-260, 1968 and 23: 129-132, 1970).

While *Oeneis macounii* is remarkably uniform over a wide range in North America, *Oeneis jutta* displays a great deal of geographic variation and those subspecies presently defined correspond quite well to the regions of temporal alternation. In Manitoba for instance, subspecies *alaskensis* appears predominately in odd-numbered years in the tundra regions near Hudson's Bay; subspecies *ridingiana* appears in even-numbered years in the northern and western parts of the province; and subspecies *ascerta* Masters & Sorensen appears in odd-numbered years to the east of Lake Winnipeg and the Red River. Interestingly in areas where the ranges of *Oeneis macounii* and *O. jutta* overlap they fly in alternative years; in Minnesota, for instance, *O. jutta* flies in odd-numbered years and *O. macounii* in even-numbered ones with the opposite situation being true west of Manitoba. It would be interesting to speculate that interspecific competition is involved here except for the fact that the butterflies have distinctly different habitats. *Oeneis jutta* is restricted to wet black spruce/sphagnum moss bogs while *O. macounii* occurs in dry, sandy jack pine areas.

In Wisconsin and areas to the east, *Oeneis macounii* is no longer found and an off-season flight of *O. jutta ascerta* sometimes occurs, although never in as great numbers as in odd-numbered years. It must be assumed that Wisconsin *jutta*, like Manitoba and Minnesota *jutta*, has a biennial life-cycle. Therefore those adults emerging in odd-numbered years are temporally isolated from adults emerging in even-numbered years, allowing an excellent potential for the eventual evolution of temporal subspecies.

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